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A NEW BLACKFLY SPECIES FROM CHANGBAI MOUNTAIN, CHINA (DIPTERA, SIMULIIDAE)

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Abstract A new species, *Simulium* (*Simulium*) *rugosum* sp. nov., from Mt. Changbai, Jilin, China is described and illustrated. This new species seems to fall into *S.* (*S.*) *tuberosum*-group. The type specimens are deposited in the Department of Biology, Guiyang Medical College, China.
Key words Diptera, Simuliidae, *Simulium*, new species, China.

The *tuberosum*-group of *Simulium* (*Simulium*) is a middle species group having following main characters: claw simple in the female; gonostylus with short spinous basal protuberance, ventral plate U-shaped with dentate margins in the male; pupal gill with 6 filaments; cocoon simple; larval abdomen usually with dark dorsal bands. There are about 42 species belonging to this group around the world (Adler *et* Crosskey, 2012) and 13 species are known from China (Chen and An, 2003; Chen, 2007). In this paper, a new species collected from Mt. Changbai, Jilin China is reported. The type specimens are deposited in the Department of Biology, Guiyang Medical College, China. Morphological terminology generally follows that of Crosskey (1969).

***Simulium* (*Simulium*) *rugosum* sp. nov.** (Figs 1 - 14)

Female. Body length about 2.8 mm.

Head narrower than thorax. Frons black, shiny and covered with several black hairs. Frontal ratio 6.0 : 4.3 : 5.5; frons- head ratio 4.0 : 22.3. Clypeus black, with whitish grey pruinosity, covered with several black hairs. Antenna composed of 2 + 9 segments, brownish yellow except scape yellow. Maxillary palp with 5 segments in proportional lengths of 3rd to 5th segments 4.4 : 4.7 : 10.6; 3rd segment with elliptical sensory vesicle about 0.38 length of respective segment. Maxillary lacinia with 19 inner teeth and 17 or 18 outer ones; mandible with 29 inner teeth and 15 outer ones. Cibarium armed smooth.

Thorax. Scutum black, shiny, with whitish grey pruinosity, moderately covered with fine whitish grey pubescence. Scutellum dark brown with long black hairs. Postscutellum black and bare, with grey pruinosity. Pleural membrane and katepisternum bare. Legs. All coxae brown except fore coxa yellow. All trochanters brown except basal 1/2 of fore trochanter yellow. All femora yellow except each apical 1/4 dark brownish. All tibiae brownish except median large portions of out surface pale. All tarsi brown except basal 2/3 of hind basitarsus and basal 1/2 of second tarsomore pale. Fore basitarsus about 6.0 times as long as wide. Hind basitarsus nearly parallel-sided, about 5.8 times as long as its greatest width. Calcipala and pedisulcus well developed. All claws simple. Wing. Costa with spines as well as hairs. Subcosta hairy. Basal portion of radius bare. Hair tuft on stem vein brown.

Abdomen. Basal scale brownish black with fringe of yellowish brown hairs. Terga brownish black except tergum 2 dull yellow. Genitalia. Sternum 8 bare medially, with about 20 strong macrosetae on each side. Ovipositor valves nearly triangular, with numerous microsetae and a few macrosetae; inner margins slightly darkened and nearly parallel from each other. Genital fork of usual reverse Y-shape; stem with considerably dilated end; arms with strongly sclerotized projection directed forward. Paraproct and cercus of moderate size. Spermatheca oval in shape and unpatterned.

Male. Body length about 3 mm.

Head. Slightly wider than thorax. Upper eye consisting of 22 or 23 vertical columns and 18 horizontal rows of large facets. Clypeus with black, whitish grey pruinosity and black hairs. Antenna black with scape brownish yellow; composed of 2 + 9 segments, 1st flagellar segment somewhat elongate, about 1.6 times as long as the following one. Maxillary palp black with 5 segments; 3rd segment of normally sized; sensory vesicle small; which about 0.22 times as long as 3rd segment.

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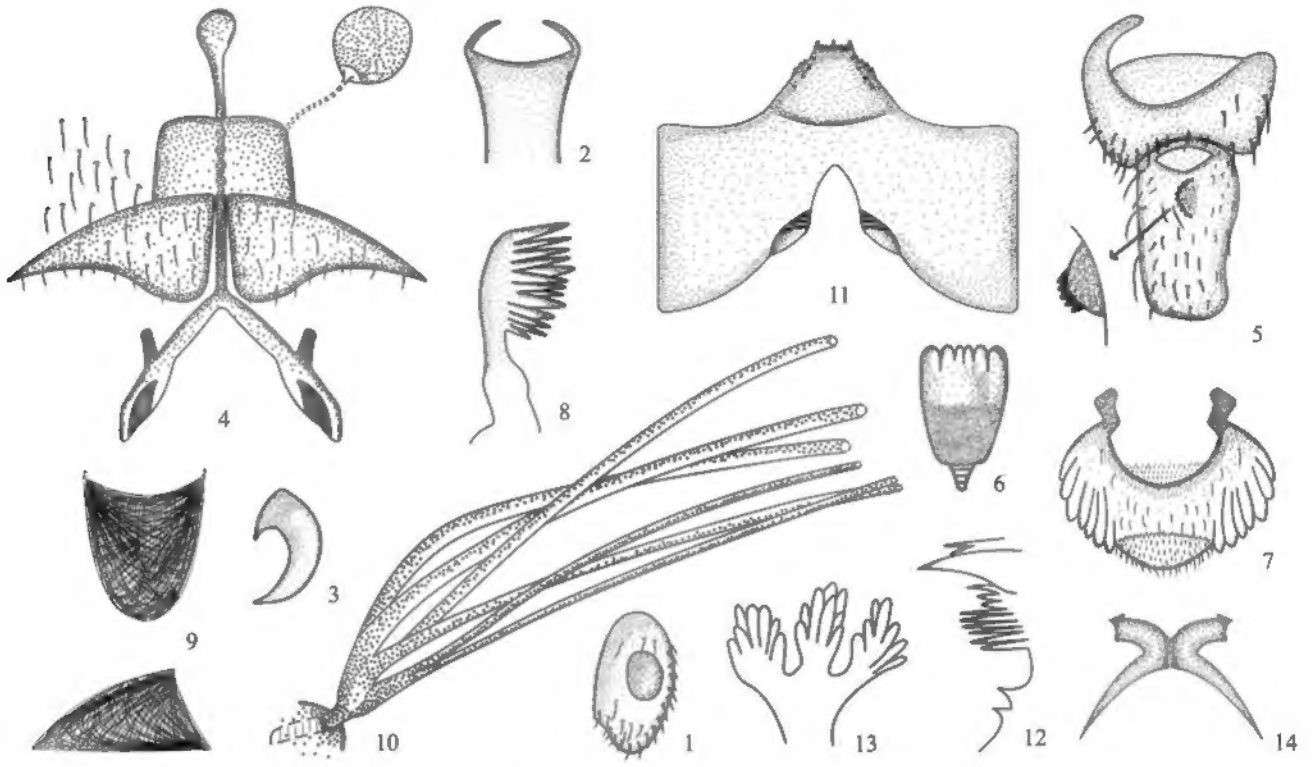

Figs 1 – 14. *Simulium* (*Simulium*) *rugosum* sp. nov. 1 – 4. Female. 1. Sensory. 2. Cibarium. 3. Claw. 4. Genitalia. 5. Gonocoxite and gonostylus of male. 6. Median sclerite. 7. Ventral plate. 8. Paramere of male. 9. Cocoon. 10. Filaments. 11. Larval head capusules. 12. Larval mandible. 13. Larval rectal gill. 14. Larval anal sclerite.

Thorax. Scutum brownish black, shiny, whitish grey dusted, densely covered with whitish-grey pubescence and also upstanding long black hairs on prescutellar area; when viewed in certain angle of light, with a pair of silvery white spots on shoulders. Scutellum brown black, shiny, with whitish grey pruinosity and several recumbent black hairs. Postscutellum black, shiny and bare. Plerual membrane and katepisternum bare. Legs. Nearly same as in female except hind basitarsus somewhat swollen, W: L = 1.0: 4.5; wing as in female except subcosta bare.

Abdomen. As in female. Genitalia. Gonocoxite in ventral view rectangular in shape, about 0.75 times as long as wide. Gonostylus much broadened, subparallel-side, about 1.3 times as long as gonocoxite, distal end rounded and with subapical spine; near base, its dorso-internal surface produce into a small protuberance bearing a row of 4 – 5 strong spines. Ventral plate U-shape, plate body with many rugae and rounded laterally, concave medially on posterior margin, and with a semicircular-like median process directed backward. Parameres each with 10 – 12 large strong hooks. Median sclerite wide, plate-like, nearly parallel-sided and with straight end.

Pupa. Body length about 5 mm.

Head and thorax. Integument brownish-yellow, densely covered with minute tubercles. Head trichomes 3 pairs and thoracic trichomes 6 pairs, all simple. Gill with 6 filaments arranged in pairs, shortly stalked, and diverged in a vertical plant at an angle of less than 45 degree; about 2/3 length than pupal body; filaments of dorsal pair much longer (1.3 – 1.5 times) and thicker (2.0 times) than that of filaments of ventral pair; all filaments running paractically parallel to one another.

Abdomen. Tergum 2 with 5 short and 1 long simple setae on each side; terga 3 and 4 each with 4 hooked spines on each side; tergum 8 with spine-combs on each side; tergum 9 with terminal hooks. Sternum 5 with pair of closed together bifid hooks on each side. Sternum 6 and 7 each with a pair of inner bifid and outer single hooks widely separated from each other. Cocoon. Wall-pocket shaped, thickly woven, anterior margin tightly woven into rim.

Mature larva. Body length 4.5 – 5.0 mm. Body color grayish yellow, with dark dorsal bands on abdominal segments. Cephalic apotome with positive spots. Each cephalic fan with 32 – 34 main rays. Antenna composed of 3 segments and apical sensillum, proportional lengths of 1st to 3rd segments 33: 48: 35. Mandible with a large and a small mandibular serration but supernumerary teeth absent. Hypostomium with row of 9 apical teeth, corner and median teeth moderately developed; lateral serration present; 4 or 5 hypostomial bristles subparallel to lateral margin.

Postgenal cleft deep, subspear-shaped, pointed anteriorly, about 3 – 4 times as long as postgenal bridge. Thoracic and abdominal integuments bare. Rectal gill lobes compound, each with 7 – 8 finger-like secondary lobules. Anal sclerite X-shaped, with broadened anterior arms which are about 0.6 times length of posterior one. Posterior circlet with 86 – 88 rows of 9 – 13 hooklets. Ventral papillae absent.

Holotype ♀, reared from pupa, slide-mounted together with its associated pupal exuvia and cocoon, collected from a forest stream from Mt. Changbai, Jilin Province, China (42° 10′ N, 100° 20′ E; alt. 2 051 m), 11 Aug. 2007, were taken from trailing grasses and decaying leaves exposed to the sun by WU Hui and HUANG Ruo-Yang. Paratypes: 6♀♀, 3 ♂♂, 12 pupae and 6 larvae, all slide-mounted, same data as holotype by WU Hui and HUANG Ruo-Yang.

Distribution. Jilin, China.

Remarks. This new species belong to *S. tuberosum* species-group as defined by Rubtsov (1956). It is characterized by the ventral plate U-shaped with a semicircular-like median process and plate body with many rugae in the male. It is closely allied to *S.* (*S.*) *gugatum* (Boldarueva) from Siberia, but the latter species (described and illustrated of Yankovsky, 2002) differs from the new species in some respects including the color of legs, and shape of median sclerite and the number of parameral hooks in the male; the distinctive shape and braching of filaments and cocoon loosely woven in the pupa.

Etymology. The specific name was given by the male ventral plate with many rugae.

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中国长白山蚋属一新种（双翅目，蚋科）

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摘 要 记述长白山蚋属蚋亚属 *Simulium* (*Simulium*) 土根蚋组 *tuberosum*-group 1 新种。模式标本存放于贵阳医学院生物学教研室。

皱板蚋，新种 *Simulium* (*Simulium*) *rugosum* sp. nov.（图 1 ~ 14）

隶属于蚋科蚋属蚋亚属土根蚋组，主要特征是雄虫生殖腹板马鞍形，侧突中凹，具半圆形腹中突，板体具众多皱纹，与报告自西伯利亚的 *S.* (*S.*) *gugatum* (Boldarueva) 近似，但后者（根据 Yankovsky, 2002 的描述和附图）仅知雄虫和蛹，其雄虫足色，中骨形状，阳基侧突钩数以及蛹呼吸丝形状和茧编织疏松等特征与新种有明显差异。

正模 ♀，吉林长白山（42° 10′ N, 100° 20′ E；海拔 2 051 m）。副模：6♀♀，3 ♂♂，12 蛹，6 幼虫，同正模，吴慧、黄若洋采。

词源：新种种名以其雄性生殖腹板具众多皱纹而命名。

关键词 双翅目，蚋科，蚋属，新种，中国。

中图分类号 Q969.442.9

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